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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/657,255	09/09/2003	Hiroto Sugahara	117094	4019

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EXAMINER	
MRUK, GEOFFREY S	
ART UNIT	**PAPER NUMBER**
2853	

DATE MAILED: 04/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/657,255	SUGAHARA, HIROTO	
	Examiner	Art Unit	
	Geoffrey Mruk	2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) *5,9,11,14,15,17-26* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,3,4,6,7,8,10,12,13, and 16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7 April 2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Claims 17-26 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 18 March 2005.

Claims 5, 9, 11, 14, and 15 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 18 March 2005.

Applicant's election with traverse of species I in the reply filed on 18 March 2005 is acknowledged. The traversal is on the ground(s) that all species can be examines without any serious burden. This is not found persuasive because a serious burden exists since the species are independent inventions (MPEP 806.04 and 808.01(a)).

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-4, 6-8, 10, 12, 13, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Pankert et al. (US 5,729,264).

With respect to claim 1, Pankert discloses a pressure generating mechanism (Fig. 2) comprising:

- a plate member (Fig. 2, element 7) made of a piezoelectric material;
- first electrodes (Fig. 2, element 71) disposed at the plate member at intervals in a plane direction of the plate member; and
- second electrodes (Fig. 2, element 73) opposite to the first electrodes in a thickness direction of the plate member substantially perpendicular to the plane direction of the plate member,
- the plate member (Fig. 2, element 7) comprising active portions formed in the plate member at intervals in the plane direction of the plate member, each of the active portions being sandwiched by the corresponding first and second electrodes and deformable in the thickness direction of the plate member (Column 5, lines 7-32); and

- a microcrack region (Fig. 3, element 39) formed in the plate member between neighboring active portions (Column 5, lines 23-32), the microcrack region including therein a large number of microcracks (Fig. 3, array of element 39).

With respect to claim 2, Pankert discloses each of the active portions (Fig. 2, element 7) is polarized in the thickness direction of the plate member. (Column 4, lines 1-39).

With respect to claim 3, Pankert discloses a driving electric field (Column 5, lines 7-22) is applied to an active portion (Fig. 2, element 7) sandwiched by the corresponding first and second electrodes (Fig. 2, elements 71, 73), the active portion is deformed in the thickness direction of the plate member and the deformation of the active portion is prevented from propagating to the neighboring active portion by the microcrack region (Column 5, lines 7-32).

With respect to claim 4, Pankert discloses the second electrodes (Fig. 2, element 73) are connected to a common wire (Column 5, lines 7-32).

With respect to claim 6, Pankert discloses the microcrack region (Fig. 3, element 39) has the same thickness as the active portions (Column 5, lines 23-32).

With respect to claim 7, Pankert discloses the microcrack region (Fig. 3, element 39) is formed over the whole length of the active portions (Fig. 2, element 7) to isolate the neighboring active portions from each other (Column 5, lines 23-32).

With respect to claim 8, Pankert discloses each active portion (Fig. 2, element 7) is sandwiched by neighboring microcrack regions (Fig. 3, array of element 39).

With respect to claim 10, Pankert discloses the mechanism further comprises a third electrode (Fig. 2, element 71) and a fourth electrode (Fig. 2, element 73) disposed between the neighboring active portions, opposite to each other in the thickness direction of the plate member (Column 4, lines 1-39, i.e. ceramic multilayer actuator), and the microcrack region is formed in a region sandwiched by the third and fourth electrodes (Column 5, lines 23-32).

With respect to claim 12, Pankert discloses the plate member (Fig. 2, element 7) comprises a plurality of piezoelectric plates put in layers, the first and second electrodes are disposed alternately between the piezoelectric plates, and the third and fourth electrodes are disposed alternately between the piezoelectric plates (Column 4, lines 1-39, i.e. ceramic multilayer actuator).

With respect to claim 13, Pankert discloses the first and fourth electrodes are disposed on one of the piezoelectric plates, and the second and third electrodes are disposed on another one of piezoelectric plates (Column 4, lines 1-39, i.e. ceramic multilayer actuator).

With respect to claim 16, Pankert discloses a liquid droplet ejection device (Fig. 1, elements 1-3) comprising:

- a pressure generating mechanism (Fig. 2); and
- a wall member (Fig. 2, element 25) including partition walls defining liquid chambers (Column 4, lines 51-65), the pressure generating mechanism comprising:
- a plate member (Fig. 2, element 7) made of a piezoelectric material;

- first electrodes (Fig. 2, element 71) disposed at the plate member at intervals in a plane direction of the plate member; and
- second electrodes (Fig. 2, element 73) opposite to the first electrodes in a thickness direction of the plate member substantially perpendicular to the plane direction of the plate member (Column 5, lines 7-32), the plate member comprising:
- active portions (Fig. 2, element 7) formed in the plate member at intervals in the plane direction of the plate member, each of the active portions being sandwiched by the corresponding first and second electrodes and deformable in the thickness direction of the plate member (Column 4, lines 1-39, i.e. ceramic multilayer actuator); and
- a microcrack region (Fig. 3, element 39) formed in the plate member between neighboring active portions, the microcrack region including therein a large number of microcracks (Fig. 3, array of element 39), the plate member being fixed to the wall member so that each of the active portions corresponds to the corresponding liquid chamber (Fig. 3, element 13) and the microcrack region corresponds to the corresponding partition wall (Column 5, lines 7-32).

2. Claims 1-4, 6-8, 10, 12, 13, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Ohashi (US 6,354,685 B1).

With respect to claim 1, Ohashi discloses a pressure generating mechanism (Fig. 2) comprising:

- a plate member (Fig. 2, element 3) made of a piezoelectric material;
- first electrodes (Fig. 2, element 9-1) disposed at the plate member at intervals in a plane direction of the plate member; and
- second electrodes (Fig. 2, element 9-2) opposite to the first electrodes in a thickness direction of the plate member substantially perpendicular to the plane direction of the plate member (Column 10, lines 23-65),
- the plate member comprising active portions (Fig. 3, element 6) formed in the plate member at intervals in the plane direction of the plate member, each of the active portions being sandwiched by the corresponding first and second electrodes and deformable in the thickness direction of the plate member (Column 10, lines 23-65), and
- a microcrack region (Fig. 3, slits between elements 6 and 7) formed in the plate member between neighboring active portions (Column 10, lines 40-67; Column 11, lines 1-4), the microcrack region including therein a large number of microcracks (Fig. 3, array of slits between elements 6 and 7).

With respect to claim 2, Ohashi discloses each of the active portions (Fig. 3, element 6) is polarized in the thickness direction of the plate member (Column 11, lines 5-14).

With respect to claim 3, Ohashi discloses a driving electric field (Column 11, lines 5-14) is applied to an active portion (Fig. 3, element 6) sandwiched by the corresponding first and second electrodes (Fig. 2, elements 9-1, 9-2), the active portion is deformed in the thickness direction of the plate member and the deformation of the active portion is

prevented from propagating to the neighboring active portion by the microcrack region (Column 10, lines 40-67; Column 11, lines 1-4).

With respect to claim 4, Ohashi discloses the second electrodes (Fig. 3, element 9-2) are connected to a common wire (Column 11, lines 5-14).

With respect to claim 6, Ohashi discloses the microcrack region (Fig. 3, slits between elements 6 and 7) has the same thickness as the active portions (Column 10, lines 40-65).

With respect to claim 7, Ohashi discloses the microcrack region (Fig. 3, slits between elements 6 and 7) is formed over the whole length of the active portions to isolate the neighboring active portions from each other (Column 10, lines 40-67; Column 11, lines 1-4).

With respect to claim 8, Ohashi discloses each active portion (Fig. 3, array of element 6) is sandwiched by neighboring microcrack regions (Column 10, lines 40-67; Column 11, lines 1-4).

With respect to claim 10, Ohashi discloses the mechanism further comprises a third electrode (Fig. 3, element 9-1, stacked alternately) and a fourth electrode (Fig. 3, element 9-2, stacked alternately) disposed between the neighboring active portions, opposite to each other in the thickness direction of the plate member (Column 10, lines 23-65), and the microcrack region is formed in a region sandwiched by the third and fourth electrodes (Column 10, lines 23-67; Column 11, lines 1-4).

With respect to claim 12, Ohashi discloses the plate member (Fig. 3, element 3) comprises a plurality of piezoelectric plates put in layers, the first and second electrodes

are disposed alternately between the piezoelectric plates, and the third and fourth electrodes are disposed alternately between the piezoelectric plates (Column 10, lines 23-67; Column 11, lines 1-4).

With respect to claim 13, Ohashi discloses the first and fourth electrodes are disposed on one of the piezoelectric plates, and the second and third electrodes are disposed on another one of piezoelectric plates (Column 10, lines 23-67; Column 11, lines 1-4).

With respect to claim 16, Ohashi discloses a liquid droplet ejection device (Fig. 1, element 20) comprising:

- a pressure generating mechanism (Fig. 2); and
- a wall member (Fig. 2, element 10) including partition walls defining liquid chambers (Fig. 2, element 4), the pressure generating mechanism comprising:
- a plate member (Fig. 2, element 3) made of a piezoelectric material;
- first electrodes (Fig. 2, element 9-1) disposed at the plate member at intervals in a plane direction of the plate member; and
- second electrodes (Fig. 2, element 9-2) opposite to the first electrodes in a thickness direction of the plate member substantially perpendicular to the plane direction of the plate member (Column 10, lines 23-65), the plate member comprising:
- active portions (Fig. 3, element 6) formed in the plate member at intervals in the plane direction of the plate member, each of the active portions being

sandwiched by the corresponding first and second electrodes and deformable in the thickness direction of the plate member (Column 10, lines 23-65); and

- a microcrack region (Fig. 3, slits between elements 6 and 7) formed in the plate member between neighboring active portions, the microcrack region including therein a large number of microcracks (Fig. 3, array of slits between elements 6 and 7), the plate member being fixed to the wall member so that each of the active portions corresponds to the corresponding liquid chamber (Fig. 3, element 4) and the microcrack region corresponds to the corresponding partition wall (Fig. 3, element 7).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Suzuki (JP 06-115070) discloses an inkjet head where "To make sure that interference between pressure chambers is eliminated and the ink discharge efficiency rate is improved by providing a groove along the axial direction of a pressure chamber on the side wall which separates the pressure chamber and a vibration plate".

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Geoffrey Mruk whose telephone number is (571) 272-2810. The examiner can normally be reached on 7am - 330pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

GSM
3/30/2005

GM

MANISH S. SHAH
PRIMARY EXAMINER

4/1/05